# Art XIV.—*A Revision of the Fossil Volutes of the Table Cape Beds, Tasmania, with Descriptions of New Species and Varieties.*

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(With Plates XX., XXI.).

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In the year 1895 I revised the Fossil Fauna of the Table Cape Beds, Tasmania, mainly from a collection made by Mr. E. D. Atkinson. Since that time I have had opportunities of examining the beds and of gathering together a fully representative collection of the fauna, as well as noting the specimens and types on view in the Hobart Museum. Lately I have also had the pleasure of examining and naming further material from these interesting beds, collected by Mr. R. N. Atkinson, a son of the above gentleman, and it seems likely that through his enthusiasm and industry many new species will be brought to light, as well as much valuable and additional information on many of the already recorded forms. As a preliminary to a further revision of the fauna as a whole I have thought it well to submit a revision of the Volutes, and include a description with figures of a new species, which has been discovered by Mr. R. N. Atkinson, and by him very generously submitted to me for that purpose.

### 1. Voluta anticingulata, McCoy.

1874. *V. anticingulata*, McCoy. Prod. Pal. Vic. Dec. i., pp. 24-26, pl. vi., figs. 2-4.

Obs.—The type of this species is in the National Museum, Melbourne, and was obtained from the Bird Rock or Spring Creek Beds, near Geelong. This species was confused by Mr. R. M. Johnston in his Geology of Tasmania with *V. antiscalaris*, McCoy, but that is quite a distinct form; nevertheless, the necessity for correcting the record must not be overlooked. This species may be regarded as a good typical one of this Tertiary horizon, and is certainly also very common in its occurrence, being readily obtainable right throughout the Table Cape section in the uppermost

layers as well as in the lowest. As is usually the case when numerous examples can be gathered of a species, varietal forms can be marked off, and this has already been very ably done by Sir F. McCoy. At least two of his well-defined varieties can be identified.

2. Voluta anticingulata, var. indivisa, McCoy.

1874. *V. anticingulata* var. *indivisa*. McCoy. Prod. Pal. Vic., Dec. i., p. 25.

Obs.—This form is a narrow type with fewer and more sigmoidal ribs. The spiral striae are confined to the anterior base, resulting in a smooth polished body-whorl and ribs, and the absence of the sub-sutural sulcus. This form is commonly represented at Table Cape. The type of this variety is in the National Museum, Melbourne, and was obtained from the Spring Creek or Bird Rock Beds, near Geelong.

3. Voluta anticingulata, var persulcata, McCoy.

1874. *V. anticingulata*, var. *persulcata*, McCoy. Prod. Pal. Vic., Dec. i., p. 25.

Obs.—The type of this variety is in the National Museum, Melbourne, and was obtained from the Spring Creek Beds, south of Geelong. The striking features of this form are the more numerous and straighter costae and the strongly-developed spiral groovings over the whole of the body whorl and spire. Usually a much rarer form than the foregoing.

4. Voluta weldii, T. Woods. (Pl. XX., Fig. 1).

1875. *V. weldii*, T. Woods. Proc. Roy. Soc. Tas., p. 24, pl. 1, f. 2.

Obs.—Another very common form at Table Cape showing an interesting range of variation, quite sufficient to warrant a similar treatment to that adopted in the case of *V. anticingulata*, McCoy. The original description of this species is of an extremely meagre character, but the figure clearly represents the broad, solid, and heavily, but sparsely nodose form, and as the type is in the Hobart Museum there can be no doubt whatever as to the form T. Woods intended to represent his species.

5. Voluta weldii, var intermedia, var nov. (Pl. XX., Figs. 2, 3).

Shell much narrower than the typical form, with a shorter and more blunted apex, more closely and acutely nodose, nodes numbering nine to twelve on the body-whorl as against about seven in the

typical form. Length 33 mm., breadth 17 mm.; as compared with length 41 mm., breadth 22 mm., in the original description.

This is the more usual form at the Muddy Creek and River Murray Cliffs sections.

Type of this variety from Muddy Creek and in my own collection.

6. Voluta weldii, var angustior, var nov. (Pl. XX., Figs. 4, 5).

Obs.—This form is rather common at Table Cape, and may be characterised by its relative narrowness, acute slope of the spire whorls, continued down to the angulation of the body whorl, and by the very faint development of nodes. Length 30 mm., breadth 14 mm.

Type of variety in my own collection.

7. Voluta strophodon, var. stolida, Johnston.

1876. *V. strophodon*, McCoy. Prod. Pal. Vic., Dec. iv., pp. 25, 26, pl. xxxvii., figs. 2, 3, 4a, 4b, 4c.

1880. *V. stolida*, Johnston. Proc. Roy. Soc. Tas., p. 36.

1888. *V. stolida*, Johnston. Geology of Tasmania, pl. xxx., figs. 4, 4a.

Obs.—McCoy illustrates well in his prodromus some of the variation to which this species is liable, and marks off figure 3 as the average form, figure 2 as a remarkably short-spired variety, and figure 4 the long-spired variety. McCoy's short-spired variety certainly occurs at Table Cape, and the form which has been named *stolida* by Johnston seems to me but another robust variation of this species. The type of *V. strophodon*, McCoy, is in the National Museum, Melbourne, but the type of *V. stolida*, Johnston, is not in the Hobart Museum, and is probably in Mr. Johnston's private collection. If the latter had been visible a more definite comparison could have been made, and greater surety given. There is no representative of this species in the Hobart Museum.

8. Voluta strophodon, McCoy, var. brevispira, var. nov.

1876. *V. strophodon*, McCoy. Prod. Pal. Vic., Dec. iv., p. 26, pl. xxxvii., fig. 2.

Obs.—In conformity with the treatment meted out to our other common volutes in having varietal names for extreme forms, it is only fair to call the specially-conoidal form by a distinctive name, viz., *brevispira*. This form occurs at Table Cape, whilst the very long-spired variety (*longispira* var. nov., McCoy's figures, 4, 4a, b, c), common in the older Tertiary clays of Victoria, has not yet

been collected there to my knowledge. A parallel series of variation in almost all their characters can be made out between *V. strophodon* on the one hand, and *V. weldii* on the other.

9. Voluta tateana, Johnston.

1879. *V. tateana*, Johnston. Proc. Roy. Soc. Tas., p. 37.

1888. *V. tateana*, Johnston. Geology of Tasmania, pl. xxx., figs. 3, 3a.

Obs.—Except for the pullus, this species is of the *V. sarissa* type, which is evidently its analogue in the Muddy Creek Beds, Victoria, so far as general habit is concerned, but its greater proportional length of body whorl to spire is a very distinctive feature, which may at once be seized upon. *V. pueblensis*, Pritchard, from Spring Creek, is another very close ally, and may, in fact, ultimately prove but a variation of this species, when a good series can be obtained, but at present the larger pullus, the more slender habit, and the delicate costation serve to distinguish the Victorian form. In a recent letter from Mr. R. N. Atkinson he mentions a volute of the tateana-sarissa type, a mature shell smaller and much more elongate than *V. tateana* amongst his discoveries. It is not unlikely that this may compare favourably with *V. pueblensis*, or help to bridge the gap between that species and *V. tateana*. Specimens of *V. tateana* are on view in the Hobart Museum, but the type is not amongst them. Tate only records the species from Table Cape on the authority of Johnston, so it is to be presumed that the type is in Mr. Johnston's collection.

10. Voluta mortoni, Tate.

1889. *V. mortoni*; Tate. Trans. Roy. Soc. S.A., vol. xi., pp. 124, 125, pl. ix., figs. 1, 2.

Obs.—The type of this species is in the Hobart Museum. This species also occurs in the Lower Beds at Muddy Creek, W. Victoria, but is usually very thin and fragile.

11. Voluta stephensi, Johnston. (Pl. XXI., Figs. 3, 4).

1879. *V. stephensi*, Johnston. Proc. Roy. Soc. Tas., p. 35.

1888. *V. stephensi*, Johnston. Geology of Tasmania, pl. xxx., f. 1.

Obs.—This large species has so far been only very poorly figured, and at the same time ill-defined, and Professor Tate does not add anything material to our information. Being a large shell, its type

of preservation in the Table Cape Beds is not such as to show all its characters in a decided manner, hence different remarks about the presence, indistinctness, or absence of spiral sculpture. I feel certain that this species is really well sculptured spirally, carrying about 24 well-defined threads on the posterior whorls. It is evidently a close ally of *V. heptagonalis*, Tate, from the River Murray Cliffs, and a critical comparison of serial specimens may show a closer connection than has hitherto been indicated.

The type of this species is apparently inaccessible, thus increasing the difficulty of satisfactorily dealing with it.

### 12. Voluta ancilloides, Tate

1889. *V. ancilloides*, Tate. Trans. Roy. Soc. S.A., vol. ix., p. 126, pl. iii., f. 7.

Obs.—The type of this species was obtained from the clay beds of Mornington or Schnapper Point, Victoria, and is in the Geological Museum of the Adelaide University. It is well represented in the Table Cape fauna, as most collections have included it, and specimens are on exhibition in the Hobart Museum. A good species and quite distinct from *V. macroptera*, McCoy.

### 13. Voluta maccoyii, T Woods.

1877. *V. maccoyii*, T. Woods. Proc. Roy. Soc., Tas., for 1876, p. 95.

1889. *V. maccoyii*, Tate. Trans. Roy. Soc., S.A., vol. ix., p. 126, pl. ii., f. 2.

1896. *V. maccoyii*, Pritchard. Proc. Roy. Soc. Vic., vol. viii., n.s. pp. 95-97.

Obs.—The type of this species is from the Table Cape beds, although the species is also very common in Victoria, especially at the Muddy Creek and Mornington sections. The Victorian representatives are of a thinner and more fragile type than the usual Tasmanian examples. In my opinion *V. polita*, Tate, should be included with this species, but I am afraid that in my endeavour to clear up some of the difficulties surrounding this species in a former paper on the Table Cape fossils, I may have added needless confusion by including *V. lirata*, Johnston. Upon more mature consideration on additional material I must admit that *V. lirata*, Johnston, should be upheld.

14. Voluta lirata, Johnston. (Pl. XX., Figs. 7, 8).

1879. *V. lirata*, Johnston. Proc. Roy. Soc. Tas., p. 37.
1888. *V. lirata, Johnston*. Geology of Tasmania, pl. xxx., f. 10.
(*V. allporti*, Johnston, non 1880).

Obs.—Mr. Johnston's description of this species is:—"Shell ovately fusiform, shining, of 7 whorls, including the smooth pullus of 1½ turns; whorls scarcely convex, and ornamented with fine, slightly curved lirae, regular and distinct above, but becoming indistinct and irregular on body whorl; the interspaces are marked with very fine longitudinal lines of growth; spire with a slightly convex outline, and forming an angle of about 50 deg.; aperture somewhat elliptical, longer than spire; lip simple, emarginate above; columella curved, with four equi-distant distinct oblique plaits; length of shell 48 mil., breadth 21 mil., length of aperture 30 mil., proportional length of body whorl 68-100ths, of penult whorl 16-100ths."

The type of this species was obtained from Table Cape, but it is not in the Hobart Museum, probably in Mr. Johnston's private collection. Professor Tate, in Part II. of "The Gastropods of the Older Tertiary of Australia," pp. 130, 131, when dealing with this species mentions that he had not seen authentic specimens, yet he gives a figure and description of a Western Victorian shell, and calls it *V. lirata*, Johnston. Comparing Tate's description with Johnston's, it is at once seen that they do not agree, hence further confusion, and an erroneous record for the Muddy Creek beds. Professor Tate appears to have entertained some doubt about his treatment of this species, for he proceeds to very briefly describe a close ally as differing by its shorter spire, more ventricose body whorl, and stronger ribs, and names it *V. costellifera*. This name will now embrace the shell figured and described by Tate as *V. lirata*. It is hard to understand how this mistake came about, especially as Mr. Johnston noted that his shell approached closely to *V. McCoyi*, while the shells before Professor Tate were of an entirely different type. *V. lirata*, Johnston (non Tate)), is a good species of the *V. maccoyi* type. It is, however, a much more robust shell, thicker and more solid, commonly with a more obtuse apex, a more convex shell, with lirae on the spire whorls. There can be little doubt that the figure given by Mr. Johnston in his Geology of Tasmania, plate xxx., figure 10, represents this species, although referred to on the explanation of the plate

as *V. allporti*, Johnston. This reference must be an error, for the description given of *V. allporti* precludes the possibility of the illustration being a correct one.

The record of *V. lirata*, from the Muddy Creek Beds, Western Victoria, should be expugned, but more recently the typical Table Cape form of this species has been collected by Dr. T. S. Hall and myself from the coastal beds below Rivernook, near the mouth of the Gellibrand River, W. Victoria.

15. Voluta pellita, Johnston.

1879. *V. pellita*, Johnston. Proc. Roy. Soc. Tas., p. 36.
1888. *V. pellita*, Johnston. Geology of Tasmania, pl. xxx., f. 2.

Obs.—This species was not recognised by Professor Tate when dealing with our Tertiary Volutes; it is, nevertheless, a good species, and should be accepted. I have elsewhere[1] pointed out some of the more striking differences between this species and *V. ancilloides* on the one hand, and *V. macroptera* on the other.

The type of this species is not in the Hobart Museum, probably it is still in Mr. Johnston's possession.

16. Voluta spenceri, Pritchard.

1896. *V. spenceri*, Pritchard. Proc. Roy. Soc. Vic., vol. viii., n.s., pp. 98-100, pl. iv., f. 1, 2.

Obs.—The type of this species is now in the National Museum, Melbourne, and is from the Table Cape Beds. It is also recorded from Curlewis in Victoria.

17. Voluta atkinsoni, Pritchard.

1896. *V. atkinsoni*, Pritchard. Proc. Roy. Soc. Vic., vol. viii., n.s., p. 100, pl. iii., f. 1.

Obs.—Type from the Table Cape Beds, and now in the National Museum, Melbourne.

18. Voluta halli, Pritchard.

1896. *V. halli*, Pritchard. Proc. Roy. Soc. Vic., vol. viii., n.s., p. 101, pl. ii., f. 1, 2, 3.

Obs.—The type of this species was obtained from the Spring Creek Beds, near Geelong (Jan Jukian) and is now in my own private collection. It is, however, a common shell at Table Cape, and on that account may have been in Mr. Johnston's collection.

1. Proc. Roy. Soc. Victoria, vol. viii., n.s., pp. 97, 98.

but if so, his treatment of it is of such an obscure and uncertain character, that it would be the merest guesswork to place it. In 1888 Mr. Johnston gave a figure in the Geology of Tasmania which did not represent *V. allporti*, though purporting to do so. In the same year Professor Tate failed to recognise *V. allporti*, Johnston.

The original description of *V. allporti*, is, "Shell large, ovately fusiform, of six regularly increasing whorls, besides a small pullus, which is too imperfect in the various specimens for description; spire acute; apical angle 45 deg., slightly concave in outline; whorls slightly convex, and only ornamented with fine longitudinal lines of growth; aperture rather narrow, elliptical; lip not expanded into a wing, simple; columella curved, with four distinct slender oblique plaits; length, when perfect, about eight inches, or 200 mil., breadth 65 mil., proportional length of body-whorl about 65-100ths of penultimate 9-100ths."

This species is referred to as the "largest Volute in Table Cape Beds, and has much the general appearance of *V. macroptera* (McCoy) in its young state, but has a smaller pullus, and differs materially in the size, number of whorls, and the absence of an expanded wing."

This description does not agree with *V. halli*, and might confuse two or three species, and in view of the confusion already existing I would recommend the removal of *V. allporti* from our lists.

19. Voluta alticostata.

1889. *V. alticostata*, Tate. Trans. Roy. Soc. S.A., vol. xi., p. 122, pl. v., f. 7.

Obs.—The type was obtained from the older Muddy Creek Beds, W. Victoria, and is in the Geological Museum of the Adelaide University.

20. Voluta macroptera, McCoy. (Pl. XX., Fig. 6).

1874. *V. macroptera*, McCoy. Prod. Pal. Vic., Dec. i., pl. viii., f. 1-4.

Obs.—The type was obtained from the Spring Creek or Bird Rock Bluff Beds, near Geelong, and is in the National Museum, Melbourne. Tate records this species as in the Hobart Museum, but the specimen so labelled that I have examined in that Museum is a young example of *V. halli*. Recently I received a genuine young example of this species from Mr. R. N. Atkinson, and this is the first occasion on which a specimen has come under my notice. The Table Cape specimen is a slight variant on McCoy's species, as it

shows a distinct costation on the earlier spire whorls and a stronger spiral striation. In my former paper I included *V. macroptera* in the list of species requiring confirmation. Professor Tate evidently accepted this, as in his later list, with Mr. Dennant, Correlation Paper, part iii., p. 134, this species was omitted from the Table Cape records.

21. Voluta wynyardensis, sp. nov. (Pl. XXI., Figs. 1, 2).

Shell of medium size, ovately fusiform, with an obliquely enrolled mammilate apex, and a few strongly and closely costate whorls ending in a narrowly ovate aperture without a simple margin.

Apical angle about forty-five degrees. The mammilate embryo is made up of two smooth obliquely enrolled whorls, in appearance indicating the probable possession of an exsert tip. Succeeding the embryonic whorls there are about four whorls, flatly convex, a shoulder gradually developing on the second, and increasing to considerable strength on the body-whorl. Distinct overlap of whorls at the suture. Whorls closely and narrowly costate, numbering about sixteen on the earlier spire whorls, increasing to about twenty on the body whorl. The whole surface marked by fine close spiral threads. The body whorl becomes rather broken up by slightly sigmoidal lines of growth, which are much stronger than the spiral threads, but the earlier whorls do not clearly show the lines of growth, while the spiral threads are quite distinct. Aperture narrow, ovate, outer lip ascending slightly at the posterior end, anterior canal relatively broad, but shallow. Columella only slightly twisted, and furnished with four narrow oblique plaits, and smooth enamelled area sharply marked off from the sculptured portion of the body whorl.

Dimensions.—Length, 80 mm.; breadth, 40 mm.; length of aperture, 47 mm.; breadth of aperture, 16 mm.; breadth of anterior notch, 7 mm.

Obs.—Type from the Table Cape Beds, collected by Mr. R. N Atkinson. A fine species, quite distinct from anything yet described, and in an excellent state of preservation except in regard to the extreme apex, the appearance would seem to point to an exsert tip, but nothing absolute can be asserted in this respect till more specimens are obtained. The specimen as described does not appear to be quite mature, but its characters are very striking, nevertheless. I am in possession of an imperfect specimen, collected by myself from these beds, which probably fits on to this species as a

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